

CLAIM AMENDMENTS:

Claim 1 (Currently Amended): A ball electrode forming method,
comprising:

preparing a semiconductor apparatus having a plurality of semiconductor devices and a plurality of electrode pads disposed on a surface of the semiconductor apparatus, the electrode pads being electrically connected to the semiconductor devices;

arranging providing a mask having an upper surface, ~~and~~ a lower surface, and a plurality of openings extended from the upper surface to the lower surface, an area of each of the openings at ~~in~~ the lower surface being larger than an area of the openings at ~~in~~ the upper surface;

arranging the mask ~~on a~~ the surface of the semiconductor apparatus ~~having the electrode pads formed thereon~~ so that the surface of the semiconductor apparatus and the lower surface of the mask ~~can~~ face each other;

arranging a plurality of solder balls on the electrode pads arranged in the openings from an ~~the~~ upper surface side of the mask; and

electrically connecting the solder balls to the electrode pads to form ball electrodes.

Claim 2 (Original): The ball electrode forming method according to claim 1,
further comprising:

applying fluxes on the electrode pads before the step of arranging the mask.

Claim 3 (Original): The ball electrode forming method according to claim 1, wherein each of the openings has a first side face extended from the upper surface to the lower surface, and an angle between the first side face and the upper surface is smaller than an angle between the first side face and the lower surface.

Claim 4 (Original): The ball electrode forming method according to claim 3, wherein the angle between the first side face and the upper surface is roughly 60° or lower.

Claim 5 (Currently Amended): The ball electrode forming method according to claim 1, wherein each of the openings has a second side face extended from the upper surface to the lower surface, and an angle between the second side face and the upper surface is roughly vertical.

Claim 6 (Currently Amended): The ball electrode forming method according to claim 5,

wherein a height of the second side face forming the ~~roughly~~ vertical angle with the upper surface is ~~roughly~~ equal to or higher than a radius of each of the solder balls.

Claim 7 (Currently Amended): The ball electrode forming method according to claim 1,

wherein the ~~plurality of adjacent~~ openings are interconnected at a ~~in the~~ lower surface side of the mask.

Claim 8 (Currently Amended): A ball electrode forming method, comprising:

peeling off a semiconductor apparatus from a wiring board, the semiconductor apparatus having a plurality of semiconductor devices and a plurality of electrode pads disposed on a surface of the semiconductor apparatus, the electrode pads being electrically connected to the semiconductor devices, and being mounted on the wiring board by a plurality of first ball electrodes formed on the ~~plurality of~~ electrode pads;

~~after the peeling step, arranging~~ providing a mask having an upper surface, and a lower surface, and a plurality of openings extended from the upper surface to the lower surface, an area of each of the openings at ~~in~~ the lower surface being larger than an area of the openings at ~~in~~ the upper surface;

after the peeling step, arranging the mask on a the surface of the
semiconductor apparatus ~~having the electrode pads formed thereon~~ so that the
surface of the semiconductor apparatus and the lower surface of the mask can
face each other;

arranging a plurality of solder balls on the electrode pads arranged in the
openings from an ~~the~~ upper surface side of the mask; and

electrically connecting the solder balls to the electrode pads to form second
ball electrodes on the electrode pads where the first ball electrodes have been
formed.

Claim 9 (Original): The ball electrode forming method according to claim 8,
further comprising:

applying fluxes on the electrode pads before the step of arranging the
mask.

Claim 10 (Original): The ball electrode forming method according to claim
8,

wherein each of the openings has a first side face extended from the upper
surface to the lower surface, and an angle between the first side face and the
upper surface is smaller than an angle between the first side face and the lower
surface.

Claim 11 (Original): The ball electrode forming method according to claim 10,

wherein the angle between the first side face and the upper surface is roughly 60° or lower.

Claim 12 (Currently Amended): The ball electrode forming method according to claim 8,

wherein each of the openings has a second side face extended from the upper surface to the lower surface, and an angle between the second side face and the upper surface is roughly vertical.

Claim 13 (Currently Amended): The ball electrode forming method according to claim 12,

wherein a height of the second side face forming the roughly vertical angle with the upper surface is roughly equal to or higher than a radius of each of the solder balls.

Claim 14 (Currently Amended): The ball electrode forming method according to claim 8,

wherein the ~~plurality of adjacent~~ openings are interconnected at a in the lower surface side of the mask.

Claim 15 (Original): The ball electrode forming method according to claim 8,
wherein the semiconductor apparatus peeled off from the wiring board includes an electrically failed place.

Claim 16 (Original): The ball electrode forming method according to claim 8,
wherein the mask is made of a metal material.

Claims 17 (New): A method of manufacturing a semiconductor apparatus, comprising:

preparing a semiconductor device having a plurality of electrode pads formed on a surface thereof;

preparing a mask having an upper surface, a lower surface and a plurality of through holes extending from the upper surface to the lower surface of the mask, each of the through holes having a top hole area at the upper surface and a bottom hole area at the lower surface, wherein the top hole area is smaller than the bottom hole area;

fixing the lower surface of the mask on the surface of the semiconductor device;

placing a plurality of solder balls through the through holes and on the electrode pads of the semiconductor device; and

electrically connecting the solder balls with the electrode pads, respectively.

Claim 18 (New): A method of manufacturing a semiconductor apparatus according to claim 17, further comprising:

applying fluxes on the electrode pads before fixing the mask on the semiconductor device.

Claim 19 (New): A method of manufacturing a semiconductor apparatus according to claim 17, wherein each of the holes has a side face extended from the upper surface to the lower surface, and an angle between the side face and the upper surface is smaller than an angle between the side face and the lower surface.

Claim 20 (New): A method of manufacturing a semiconductor apparatus according to claim 17, wherein each of the holes has an upper cylinder hole extended from the upper surface to a middle of the mask and a lower cylinder hole extending from the middle of the mask to the lower surface.

Claim 21 (New): A method of manufacturing a semiconductor apparatus according to claim 17, wherein each of the holes has a side face extended from the upper surface to a middle of the mask, an angle between the side face and

the upper surface being smaller than 90 degrees, and the holes being interconnected with each other at the lower surface.